

(PCT Article 36 and Rule 70)

Form PCT/IPEA/409 (cover sheet) (January 2004)

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/002738

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-2, 6-19 as originally filed/furnished
- pages\* 3-5 received by this Authority on 11.07.2005
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 4 as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 3, 8-12 received by this Authority on 11.07.2005
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- sheets 1-4 as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☒ the claims, nos. 1, 2, 5-7
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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| Box No. V   | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |            |     |
|---|---|------------|-----|
| 1. Statement  |   |            |     |
| Novelty (N)   | Claims  | 3, 4, 8-12 | YES |
|   | Claims  |            | NO  |
| Inventive step (IS)   | Claims  |            | YES |
|   | Claims  | 3, 4, 8-12 | NO  |
| Industrial applicability (IA)   | Claims  | 3, 4, 8-12 | YES |
|   | Claims  |            | NO  |
| 2. Citations and explanations (Rule 70.7)   |   |            |     |
| Document 1: JP 1-117303 A (Taiyo Yuden Co., Ltd.), 10 May 1989, entire text   |   |            |     |
| Document 2: JP 2001-135511 A (Sumitomo Special Metals Co., Ltd.), 18 May 2001, paragraphs [0022] to [0026]; [0045] to [0047]  |   |            |     |
| Document 3: JP 61-170565 A (Fujitsu Limited), 1 August 1986, entire text; fig. 3  |   |            |     |
| Document 4: JP 2002-260942 A (Sumitomo Special Metals Co., Ltd.), 13 September 2002, entire text; all drawings  |   |            |     |
| Claims 3, 4 and 8 to 12   |   |            |     |
| <p>Document 1 sets forth a permanent magnet, wherein Tb and Dy are diffused in the proximity of the surface of an R-Fe-B sintered magnet to provide a layer with a higher inherent coercive force than inside the magnet; and with a sintered body as an anode, sputtering is carried out with Dy metal as a cathode target to form a Dy thin-film layer, then the sintered body having a thin-film layer is subjected to heat treatment. The value for BHmax at the front is also disclosed.</p> |   |            |     |
| <p>Document 2 sets forth a minute Nd-Fe-B sintered magnet which has been surface coated, wherein when the</p>   |   |            |     |

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement

shape of the Nd-Fe-B sintered magnet has a surface area of  $S\text{mm}^2$  and a volume of  $V\text{mm}^3$ , the value for  $S/V$  preferably falls within the range of  $2\text{mm}^{-1}$  to  $20\text{mm}^{-1}$ ; and a shape such as a ring with a hole inside is formed by machining a large blank.

Newly cited document 4 sets forth a unit which rotatably supports suspending members (8) in order to suspend ring-shaped bonded magnets (30) as 8 holding members on a rotatably supporting member (7) around a rotating shaft (6) in a horizontal direction; and a feature wherein an inorganic coating is vapor-deposited on the surface of an Nb-Fe-B bonded magnet.

In addition, as described in document 3, a sputtering device using an opposing target is a known feature.

In addition, it would be easy for a person skilled in the art to conceive of machining a surface-treated R-Fe-B sintered magnet into a ring-shape as set forth in document 2 as an alternative to the shape of the R-Fe-B sintered body set forth in document 1, to constitute a minute shape having a predetermined  $S/V$  value; and to apply the configuration of the vapor deposition device set forth in document 4 and known features to the device to carry out sputtering set forth in document 1.

In addition, in the light of the fact that in the invention set forth in document 1, a large quantity of Dy is segregated the inner part of the magnet to  $50\mu$  inside the magnet surface, and that the invention has the same  $BH_{\text{max}}$  value as the invention of this application, it is understood that R metal has permeated to the same depth

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as the invention of this application.

In addition, determining whether to carry out diffusion metallizing while film-forming at a high temperature, or to carry out diffusion metallizing after carrying out heat treatment after film-forming, would merely constitute a design feature which a person skilled in the art could accomplish as necessary.